

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Issued October 12, 1912.

U. S. DEPARTMENT OF AGRICULTURE.

FARMERS' BULLETIN 511.

FARM BOOKKEEPING.

BY

EDWARD H. THOMSON,

*Agriculturist, Office of Farm Management, Bureau of
Plant Industry.*



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1912.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
OFFICE OF THE CHIEF,
Washington, D. C., June 8, 1912.

SIR: I have the honor to transmit herewith and to recommend for publication as a Farmers' Bulletin a manuscript entitled "Farm Bookkeeping," prepared by Mr. Edward H. Thomson, Agriculturist, under the direction of the Agriculturist in Charge of the Office of Farm Management of this Bureau.

This paper has been prepared in response to numerous inquiries for information on the subject. It is believed that its publication will assist farmers in arriving at a better understanding of their farm business.

Respectfully,

B. T. GALLOWAY,
Chief of Bureau.

HON. JAMES WILSON,
Secretary of Agriculture.

CONTENTS.

	Page.
Introduction.....	5
Difficulties of farm bookkeeping.....	6
Types of farm bookkeeping.....	6
Simplifying the record work.....	7
What accounts to keep.....	8
Farm inventory.....	9
Determining values and depreciation.....	12
Cash accounts.....	15
Farm receipts.....	19
Farm expenditures.....	20
What constitutes farm profit.....	20
Labor records.....	22
Records of separate farm enterprises.....	26
Live-stock records.....	30
Live-stock production records.....	33
Feeding records.....	34
Interpretation and use of farm accounts.....	35
Summary.....	36

ILLUSTRATIONS.

	Page.
Fig. 1. Curve showing the actual monthly cost per hour of farm labor on a New England dairy farm in 1910.....	24
2. Curve showing the average hours of work per day per farm work horse on a 320-acre grain and stock farm in Iowa.....	25
3. Illustration of a form of monthly labor-report blank.....	26
4. Illustration of a desirable form for detailed farm-labor records.....	27



FARM BOOKKEEPING.

INTRODUCTION.

The fact that there are 6,400,000 farmers in this country, each of whom is utilizing land, labor, and capital as a means of deriving an income, is sufficient reason for a brief discussion of the principles of farm bookkeeping.

Farming is a business the same as banking or running a department store. It is a business which involves the production and sale of several kinds of products. Two important points must be considered: (1) What does it cost to produce these products? (2) By selling at market prices, what profit is made on them?

The problem of the farmer is to meet conditions on his own farm in a way which will give him the greatest net returns for his labor and the use of his capital. He should receive interest on his capital as well as wages for his labor, but owing to the lack of proper records few farmers know what wages they actually receive. There is reason to believe that the majority of farmers are really living on the interest of their investments rather than on the profits of their farms.

A very large number of farm problems have been worked out in the experiences of farmers—far more, in fact, than have ever been worked out in any other way. There are some problems, however, which have not been thus solved. The problem of farm bookkeeping is one of these. One of the reasons for this is that what instruction the farmer has had on the subject has been misleading. As in the matter of architecture, so in bookkeeping the main work that has been done has related to city conditions and is not applicable to conditions on the farm. Hence it is that the problems of farm architecture and farm bookkeeping are not satisfactorily worked out. Those farmers who have tried to keep books have usually used systems devised by city bookkeepers who do not know the conditions to be met in keeping books on the farm. Even where the systems have been modified in the attempt to meet farm needs they have usually retained features of ordinary commercial bookkeeping that rendered them unsuited to the farmer's needs.

farm buildings, fences, ditches, etc., whether the farm is rented or owned by the operator.

This bulletin is not an attempt to outline a system of bookkeeping

(2) Do not consider that the farmer or his family receive anything for their labor unless they are paid in cash the same as hired labor. If there is a surplus at the end of the year, it is their compensation. In this way the accounts will not be confused with items not strictly cash.

(3) Farm products used by the household should not be credited to the farm in the cash account along with products sold, but should be taken care of separately.

WHAT ACCOUNTS TO KEEP.

The questions that always come up when starting out to keep farm records are: What does one wish to know about the farm as a whole or about the different things on the farm? Are the records to show only the net profit made in the year, or are they to include what each part of the farm cost and what each part returned? These questions must be decided by everyone intending to keep a set of farm accounts.

It is at this point that difficulty arises in keeping records, unless one has a clear idea of what he is intending to find out and then keeps such records as will give him that information. It is one thing to know what records should be kept, and an entirely different thing to know how to keep them. It is equally important to know what records should not be kept. This will be largely determined by the kind of farming that is followed. The simplest records are not always the most useful. Not to know clearly what accounts are essential has been the means of discouraging many attempts at farm bookkeeping. Many farmers seem to think that if they can get the proper books or forms they will be able to ascertain at the end of each year the exact financial conditions of their farms. This idea is entirely wrong. Any kind of a blank book will do, as it is the records that need to be considered. It is important, therefore, to know at the start what results can be obtained from certain records.

If only the total net gain or the net loss of the farmer (not the farm)¹ for the year is wanted, then but two records are needed. These two records are (1) a complete inventory of the farm business at the beginning of the year, and (2) another at the end of the year. The difference between these inventories gives the net increase or decrease in the farmer's wealth for the year. This difference will not correspond with the cash on hand or in bank, for much of the increase may be due to additional stock on hand or to unsold products. Furthermore, it does not take into account the farmer's personal and living expenses during the year, the money for which came from the farm income, nor the value of the supplies which the farm furnished to the family. These items will not be shown in the inventory at the end of the year,

¹ The farm may have made a handsome profit during the year and yet the farmer may be poorer than he was before by reason of having spent all the profit of the farm and more besides.

but the difference between the two inventories will show how much more or less one is worth than he was the year previous, exclusive of household and personal goods.

FARM INVENTORY.

The one most important record on any farm is the inventory. A large number of farmers keep a memorandum of cash transactions, including sales and expenses, but never once do they stop to determine the amount of their investments or how their money is invested. An inventory is a sort of guide or milepost, if it may be called such, which tells one where he stands each year. Without it he is absolutely unable to determine the profit or loss on the farm for the year or to determine his net worth.

What is a farm inventory, and what should it include? It is simply a statement showing what the land, buildings, equipment, live stock, and produce on hand are worth at the time the inventory is taken. It is a list of farm property and of farm debts. It should be itemized to show separately what the farm is worth, the value of each machine, the value of each group or head of live stock, the products for feed or for sale, the material or supplies on hand, and the cash on hand or in bank. It must also show all the bills which the farmer owes other people and which other people owe him.

Sample farm inventory: Farm of ———.

Property.	April 1, 1911.			April 1, 1912.		
	No.	Rate.	Valuation.	No.	Rate.	Valuation.
REAL ESTATE.						
Farm of 180 acres (155 tillable), including buildings (dwelling \$1,600, barns \$1,800, other buildings \$600), fences, and other improvements.			\$13,500.00			\$13,500.00
LIVE STOCK.						
Dairy cattle:						
Cows, dry and in milk	24	\$50.00	\$1,200.00	26	\$50.00	\$1,300.00
Bull	1		50.00	1		45.00
Calves	6	14.00	84.00	8	15.00	120.00
Two-year olds	4	28.00	112.00	6	20.00	120.00
Total value of dairy cattle			1,446.00			1,585.00
Hogs:						
Brood sows	2	22.00	44.00	2	21.00	42.00
Pigs	8	4.00	32.00	6	3.00	18.00
Total value of hogs			76.00			60.00
Horses:						
Horse, Jim, 7 years old	1		200.00	1		180.00
Team, Nell and Bess, 5 and 6 years old	1		425.00	1		425.00
Team, Jack and Prince, 6 and 7 years old	1		400.00	1		400.00
Colt, 1 year old	1		75.00	1		145.00
Total value of horses			1,100.00			1,150.00

Sample Farm inventory: Farm of ———.—Continued.

Property.	April 1, 1911.			April 1, 1912.		
	No.	Rate.	Valuation.	No.	Rate.	Valuation.
LIVE STOCK—continued.						
Poultry:						
Hens.....	160	\$0.60	\$96.00	125	\$0.60	\$75.00
Roosters.....	5	1.00	5.00	4	1.00	4.00
Turkeys.....	2	3.00	6.00	3	3.00	9.00
Total value of poultry.....			\$107.00			\$88.00
Total value of live stock.....			2,729.00			2,883.00
MACHINERY AND TOOLS.						
Grain binder.....	1		90.00	1		82.00
Sulky plows.....	2	45.00	90.00	2	41.00	82.00
Disk harrow.....	2	28.00	56.00	2	25.00	50.00
Mower.....	1		35.00	1		30.00
Hay rake.....	1		20.00	1		19.00
(List all items of farm machines, wagons, harness, and small tools.)						
Total investment in machin- ery and tools (not all listed here).....			475.00			461.00
FEED AND SUPPLIES.						
Farm products:						
Corn.....bushels..	80	.60	48.00	125	.60	75.00
Oats.....do.....	200	.42	84.00	90	.50	45.00
Potatoes.....do.....	40	.75	30.00	80	.60	48.00
Hay, timothy.....tons..	10	16.00	160.00	20	15.00	300.00
Hay, mixed.....do.....	5	12.00	60.00	4	12.00	48.00
Silage.....do.....	40	4.00	160.00	40	4.00	160.00
Bran.....do.....	0½		15.00			
Mixed feed.....do.....	1		31.00	2½	30.00	75.00
Seed oats.....bushels..	30	.80	24.00	35	.80	28.00
Seed potatoes.....do.....	45	.80	36.00	50	1.00	50.00
Seed corn.....do.....	3	2.00	6.00	3	2.00	6.00
Cement.....sacks.....	4	.50	2.00			
Twine.....pounds.....	20	.10	2.00	10	.10	1.00
Total value of feed and sup- plies.....			658.00			836.00
BILLS RECEIVABLE.						
J. A. Brown, hay.....tons..	2	13.00	26.00			
R. S. Jones, potatoes.....bushels..	40	.50	20.00			
Total.....			46.00			
CASH.						
On hand.....			90.00			210.00
In bank.....			580.00			1,938.00
Total.....			670.00			2,148.00
BILLS PAYABLE.						
Farm mortgage.....			2,000.00			1,500.00
SUMMARY.						
Real estate.....			13,500.00			13,500.00
Live stock.....			2,729.00			2,883.00
Machinery and tools.....			475.00			461.00
Feed and supplies.....			658.00			836.00
Bills receivable.....			46.00			
Cash on hand and in bank.....			670.00			2,148.00
Total investment.....			18,078.00			19,828.00
Bills payable.....			2,000.00			1,500.00
Net worth.....			16,078.00			18,328.00
Increase in inventory, \$2,250.						

The foregoing form will give an idea of a farm inventory. It will be noted that the inventory is divided into seven parts or divisions. Such division is not absolutely necessary, but it is usually desirable to know how much of the total capital is in live stock, how much in machinery, etc.

The first division includes what is known as real estate. Under this heading is placed the land, buildings, fences, wood lots, and all items of that nature, which it is not desirable to itemize separately, for the farm is thought of as consisting of the land, buildings, and other permanent improvements. If it is sold all of these items are included. In placing the value on the farm, estimate so much per acre or else fix upon a lump sum.

The next division is live stock, where the different classes are entered separately—as horses, cattle, hogs, poultry, and the like. Each class is itemized as far as practicable. Thus, one can tell any year his total investment in horses or other classes of live stock. In taking this inventory each animal should be given a separate value or some method followed so that in taking the second inventory each class or individual can be recognized.

A third division in the inventory is the machinery and tools. This division contains the largest number of items to be listed, as this part of the equipment on a farm is always varied and consists of a large number of implements. In taking the inventory of the machinery and small tools, it is important to use care not to overlook any item, using the best judgment possible in placing the values on different articles. If certain machines are overlooked in one inventory and then included in the next it causes an inaccuracy in the records which could be easily avoided. If it is carefully taken and each item listed separately a machinery and small-tool inventory on a farm will fill several pages. If such detail is not desired, the minor tools of the value of less than \$1 each may be grouped into a class together and a lump valuation given, but such a course is not advisable. It is surprising what a large number of these small tools there are on a farm and, furthermore, what a number are misplaced during the year. A carefully itemized inventory once a year is a help in locating the minor tools, and inventory day is a convenient time to call in all lent tools, which have a habit of changing owners if they remain too long away from home. All farmers know how easy it is to lose a hammer or an ax, but an old wagon never disappears. Circular No. 44 of the Bureau of Plant Industry, entitled "Minor Articles of Farm Equipment," gives a very complete list of small tools on a farm.

The fourth division of the inventory includes feed and supplies. Some of the items in this division are hard to estimate closely, as,

for instance, the number of tons of hay, straw, and other produce. Care must be used in listing the items to include all farm supplies, such as binding twine, fertilizers, machine oil, lumber, etc.

The fifth division consists of bills receivable, which should include all bills and accounts due the farm. Each account ought to be listed separately. Of course, these face values do not always represent real values, but each should be noted until it is either settled or proved to be worthless.

The sixth division of the items in an inventory consists of the amount of money on hand and in bank. This last item should be accurate in every detail.

The sum of these six divisions will be the total investment in the farm. This investment is not necessarily the net worth, for as yet the bills payable have not been deducted. So another division should be made, listing in it bills and accounts payable, the sum of which should be subtracted from the total investment to obtain the net worth. It must be understood that in this inventory no mention has been made of the household furnishings or personal articles, as only the farm and its accessories have been considered. It is true that the house has been included in the value of the farm, but this is necessary, as it is a part of the real estate and would be included if the place were sold. If a farm has two houses, the value of one not used for farm purposes need not be listed where the farm can be sold without it.

It will be noted in the inventory form shown that there is a place for the values on April 1 of one year and for a corresponding value of the same item the following year. This inventory form is only one of many which can be used, but it is presented because it has proved to be convenient and useful in taking farm inventories. In using an ordinary ruled book for this work it is well to have a separate page for each division of the inventory. For instance, on one page place the real estate and all items pertaining to it, on another the live stock, and so on. Then on another page bring together the totals for each of the different groups to give the total investment. By following this method space will be found for the new items that must be added to the inventory at the end of the year.

DETERMINING VALUES AND DEPRECIATION.

There are many opinions on the question of how farm values should be determined. It has been suggested that the value of a farm should be its original cost to the present owner, but the objection to this idea is that the present value may be much greater, or in exceptional cases much less, than the original cost. The increased value may be the result of labor and cash expended thereon in per-

manent improvements by the owner. Then again, the farm may have cost the present owner nothing, coming to him as a legacy. On the other hand, unusually high or speculative values should not be used, as they are likely to mislead and deceive even the owner. This danger of overvaluing the farm and other items must be carefully guarded against, as no benefit can come from it. In taking the farm inventory it is a good rule to place the values on all different items as nearly as possible at the amount for which they could be sold. This must not be construed to be the values that would be obtained at a forced sale, but those secured under normal conditions. This method of placing values on real estate, live stock, and machinery may seem unjust in that it is likely to give too low values to the different items. But the danger of placing values too low is not nearly as great as that of getting them too high and then finding at the end of the year that many items did not warrant such high valuations.

In the case of real estate the decrease in value due to natural depreciation is not nearly as great as on machinery. Few accurate data relating to the depreciation of buildings are available; furthermore, it is difficult to estimate such depreciation, and it will vary greatly in different regions. It would seem that a fair allowance for the depreciation of buildings is about 3 per cent. One's judgment must govern him in using the depreciation figures. It often happens that the increase in land values from year to year will more than offset the depreciation in buildings and other improvements. If this increase in land values is at a moderate rate it may be safe to assume that there has been no net loss on real estate through depreciation for that particular year. Furthermore, on well-managed farms the amount spent for repairs and for the maintenance of the buildings and fences is sufficient to keep them in nearly as good condition as they were at the beginning of the year. In other words, as soon as one stops repairing or keeping up buildings and fences the rate of depreciation is greatly accelerated. In the case of tile drains, which are a part of the farm, the depreciation is small, largely depending upon the quality of the tile and the care used in laying them and in keeping the outlets open. On farms in regions where the land values are not advancing, if there is a wood lot the annual increase in the growth of timber may offset any loss through depreciation.

In determining the values of the live stock, one should be governed by the market prices for the different classes. Inasmuch as the market varies from year to year it may be low one year and high the next, thereby decreasing or increasing the capital. It is impossible to overcome this variation, and a man's worth will fluctuate with the market values of what he owns. If no attention is

paid to market values it may be found that after a few years certain classes of property may have steadily declined in value, and if inventory values are not decreased accordingly a fictitious profit would be shown each year.

In valuing the machinery some problems may be encountered. It is well known that a machine depreciates in actual market value rapidly the first year used, or even the first few months used. That is, a mowing machine may sell new for \$45, but let it be used a month, thereby making it second hand, and it will be difficult to obtain \$35 for it. This is even more marked with other kinds of tools. The farmer buying new equipment during the year will find the market value of that equipment at the end of the year much less than the original cost. For the second and third year's use the market value of the machine may not appreciably decrease. In other words, a mower that has been in use three years will sell for almost as much as one that has been in use three months. The rate of depreciation on machinery has been variously estimated from 6 to 10 per cent. This rate, however, is affected by a large number of factors. Some farmers, who take care of their machinery, will make an implement last twice as long as others; on some farms the rate of depreciation must necessarily be low, while on others it will be high. Again, the rate of depreciation on certain machines is much greater than on others, and this factor needs to be taken into consideration.

Mr. Grant G. Hitchings, a practical New York farmer who has given much attention to bookkeeping, uses the following method in taking his machinery inventory: He deducts 10 per cent of the machinery investment and to the remainder adds the cost of the new implements purchased during the year. For instance, if his machinery was worth \$425 at the beginning of the year and during the year a new mower and a horse rake were purchased for \$70, the next year's inventory would be \$452.50. This result is determined by deducting 10 per cent of \$425, giving \$382.50, then adding \$70, the value of the new machines purchased. This method will undoubtedly not give a correct equipment inventory for certain years, but when used over a long period the values should be nearly correct. If it is found that this rate is too high or too low a new inventory can be taken any year and the total investment corrected. This method is a practical way of handling the depreciation on machinery, but is not recommended in farm cost-accounting investigations.

In determining the values of feeds and produce the farm price should be used. This price should be that at the nearest market less the cost of transportation to the station.

The best time to take an inventory varies in different parts of the country, depending upon the season and the business practice in the particular region. In the Northern and Eastern States perhaps the best date is March 1 or April 1; in the South an earlier date might fit very well. In the Central States, March 1 is undoubtedly the best time, because all farm business transactions in that region date from that day, while in the eastern part of the country the farmers' day of reckoning is April 1. This ordinarily corresponds with the date on which tenants change farms. On fruit farms, truck farms, and the like, January 1 is satisfactory; on poultry farms September 1 or October 1 is a good date, because the new poultry year usually starts at the time that the hens are placed in winter quarters. The most convenient time for taking the annual inventory thus varies with conditions.

Upon completing the first inventory the most important of the year's records is finished, for without this inventory one has no basis on which to build future records and is at a loss to know whether he is gaining or losing, while with a good, clear inventory of all his property he is prepared to keep such other records as will give him the information he desires at the end of the year.

CASH ACCOUNTS.

In starting to keep a record of the cash items it is of the utmost importance to know definitely just what records are wanted.

In order to make the cash account balance, i. e., to correspond with the cash on hand or in bank, one needs to have an account of all expenses. Inasmuch as the household items are usually bought along with the farm items, they must necessarily be included in the records. However, the reason for keeping a record of household accounts along with those of the farm is to keep the books in balance. They add work to farm bookkeeping and are not a part of the real farm records. By an examination of the account books of eight farms it was found that of all the cash transactions recorded the items pertaining strictly to the farm formed 54.6 per cent, the personal items formed 22.1 per cent, and household items 23.3 per cent. The average number of cash items entered on the books was 577, and of this number only 315 were farm items. It would seem best not to keep the household accounts in detail, but to combine all the household items for each day into one entry, unless the housekeeper wishes to so keep them as to know how much of each article is used. All the items pertaining in any way to the farm business should be itemized carefully.

A blank form well adapted for handling these cash items is known as a daybook form and consists of a plain ruled page similar to that in most books designed for bookkeeping. The right-hand

column is used for totals and the column to the left of it for the different items. This form is very simple and can usually be obtained at any stationery store. There are various other forms, many of which are useful and possibly better than the one here described, but farm bookkeeping is not a question of forms; it is a question of what records to keep and how to use them. The most carefully devised bookkeeping blanks will not give good farm records unless the person doing the work has a clear idea of the purpose of the records.

Of the several ways of keeping cash accounts, three will be briefly discussed. A method commonly used by farmers is to enter "Receipts" on one page and "Expenditures" on another. Under one head place all items bought and under the other all items sold, as stock, crops, and other products.

One method of keeping cash receipts and expenditures.

RECEIPTS.

1911.

April	2	20 bushels potatoes, at .60.....	\$12.00	
	2	18 dozen eggs, at .21.....	3.78	
	7	2 tons hay, at 16.00.....	32.00	
	7	1 cow to J. Brown.....	47.50	
	7	30 dozen eggs, at .20.....	6.00	
	7	3 bushels seed potatoes, at 1.00.....	3.00	\$104.28

EXPENDITURES.

1911.

April	2	1 ton cottonseed meal for dairy.....	\$35.00	
	2	Strap for work harness.....	.35	
	2	Personal.....	2.25	
	2	Household.....	1.60	
	7	Garden seeds.....	8.00	
	7	Express on seeds.....	.85	
	7	2 milk pails.....	2.00	
	7	Household.....	.86	
	7	Repairing plow.....	1.20	\$52.11

For a simple, easy scheme of bookkeeping such a record is very satisfactory and if followed out to the end of the year will give all business transactions. But if one wishes to know the aggregate income from the sale of eggs or of milk, it will be necessary to go through the records and pick out all these items and add them separately. In other words, such a record gives the total receipts but does not classify them. In order to ascertain what each enterprise returns to the farm it is necessary to classify all records under their respective headings. This operation, known as posting the original entries, is nothing more than classifying the items under their respective heads. The totals of these separate accounts can then be added to give the receipts for the year.

Below is illustrated the total cash receipts and cash expenditures for a farm and the distribution of the same. A further discussion of what constitutes farm receipts and farm expenditures will be given later.

Statement showing summary of cash receipts and expenditures on a farm for the year.

RECEIPTS.

	Milk	\$2,800.00	
	Apples	180.00	
	Potatoes	1,100.00	
	Hay	190.00	
	Cattle	145.00	
	Eggs	174.00	
	Poultry	26.00	
	Wood	40.00	
	Bills receivable (collected)	46.00	
			\$4,701.00

EXPENDITURES.

	Labor	\$800.00	
	Feed purchased	480.00	
	Fertilizer	125.00	
	Seed	70.00	
	Lumber for building	50.00	
	Miscellaneous farm	180.00	
	Household	420.00	
	Personal	148.00	
	Thrashing	42.00	
	Cattle purchased	175.00	
	Taxes	133.00	
	Interest on debt	100.00	
	Debt (paid)	500.00	
			\$3,223.00

The second method of handling the cash transactions is to make the original entry direct upon its account; that is, instead of putting all the different items down one after another on one page, to classify them as they are entered in the book.

Cash items entered direct to their respective accounts.

DAIRY.

1911.			Received.	
April	9	2 cows to C. Brown	\$88.00	
	9	1 yearling to Smith	19.00	
	15	Milk and cream	114.25	\$221.25

DAIRY.

1911.			Paid.	
April	2	1 ton cottonseed meal	\$35.00	
	2	2 milk pails	2.00	
	10	1 cow from A. Johnson	57.50	
	10	One-half ton bran	15.50	\$110.00

By this method all items pertaining to the sale of milk and dairy products will be put under "Dairy," all items for the sale of eggs and poultry will come under "Poultry," etc. This is known as entering accounts direct to the ledger or, as it is sometimes called, a classified daybook. This system has proved satisfactory with many farmers.

The third method is that illustrated below and is similar in principle to the second method, the difference being that as all the accounts appear on two pages it is an easy matter to ascertain the totals and to balance the cash account. Unless a wide blank is used it does not admit of many accounts, but on most farms only a few are needed.

Form illustrating special-column cashbook; items entered direct to separate accounts.

RECEIPTS.

1911.		Item.	Dairy.	Poultry.	Crops.	General.
April	2	2 yearlings to Jones.....	\$35.00	.....	.....	.....
	3	2 tons of hay to Brown.....	.....	.....	\$32.00	.....
	4	14 dozen eggs, at 25 cents.....	.....	\$3.50	.....	.....

EXPENDITURES.

1911.		Item.	Dairy.	Poultry.	Crops.	General.
April	2	1 ton wheat bran.....	\$23.00	.....	.....	.....
	2	10 bushels seed oats, at \$1.....	.....	.....	\$10.00	.....
	7	2 bags chicken wheat.....	.....	\$2.50	.....	.....

This special-column cashbook can also be used in taking account of the expenditures, listing them under several headings, as "Live stock," "Crop," "Household," "Personal," and "General" expenses, care being taken to exclude anything which is not actually a cash transaction. By keeping the records in this way one will be able to balance his cash with the totals as shown by the accounts, but if items not cash are included in any of these accounts it will be difficult to make the records balance. In the following form some suggestions are given for keeping the cash transactions. The most detailed records are not usually the best records.

Illustration of desirable and undesirable detail in entry of household and personal items; also of complete and incomplete detail in entry of items pertaining to the farm.

COMPLETE AND DESIRABLE.

1911.		Item.	Received.	Paid.
Sept.	29	Coal for thrashing, three-fourths ton, at \$4.....	.....	\$3.00
		Household expense.....	.....	.89
	30	Sold 2 tons hay of this year's crop, at \$15.....	\$30.00	.....
		Personal expense.....	.....	2.55

Illustration of desirable and undesirable detail in entry of household and personal items; also of complete and incomplete detail in entry of items pertaining to the farm—Cont'd.

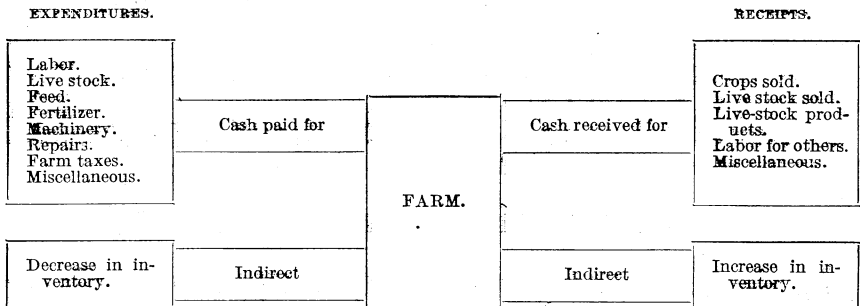
INCOMPLETE AND UNDESIRABLE.

1911.		Item.	Received.	Paid.
Sept.	29	Coal.....		\$3. 00
		2½ pounds steak.....		. 45
		Bread.....		. 20
		3 pounds rice, at 8 cents.....		. 24
	30	Hay.....	\$30. 00	
		Cravat.....		. 25
		Shoes.....		2. 00
		Candy and peanuts.....		. 30

FARM RECEIPTS.

It may be well at this point to state definitely what constitute farm receipts. This can best be made clear by the use of the following diagram:

Diagram of farm receipts and expenditures.



Here the farm is considered as a unit, and the money received for everything which goes off the farm represents a farm receipt. The money paid for everything which comes to the farm from outside represents an expenditure. There is one other receipt which the foregoing rule does not cover, i. e., the increased inventory. A farmer may work on his own place, such as building a barn or putting in tile ditching, and thereby greatly increase the value of his farm. This increase represents a receipt just the same as crops or stock sold, but it is received indirectly. The only place where this receipt will come into the accounts will be the inventory. To make this point still clearer, all the items representing farm receipts are grouped into six divisions, as follows:

1. Crops sold from the farm.
2. Live stock sold from the farm.
3. Stock products sold from the farm.
4. Money received for labor for others, such as teaming or hauling.
5. Miscellaneous (old machinery or supplies).
6. Increased inventory or increased investment in the farm.

The total of these items constitutes the farm receipts for the year, exclusive of what the farm furnishes toward the owner's living.

FARM EXPENDITURES.

It is well to outline what constitute farm expenditures. The same rule holds true here as with the farm receipts, i. e., nothing not paid for in cash represents a farm expenditure, except a decreased inventory. This decreased inventory is likewise taken care of by the difference in the inventories at the beginning and at the end of the year. Often records are found which give such items as this: "One horse died, value \$100." This item has been added in with other farm expenditures, when in reality it is not an expenditure at all. True, it is a loss, but this loss will be shown by the live-stock inventory at the end of the year.

In this discussion the farm has been considered as a unit in its relation to the outside world and in no case has the relation existing between different enterprises on the farm been considered, i. e., the records which have been explained up to this point will not show what each crop or class of live stock is paying, as they pertain to the farm as a unit and not to any individual enterprise. Before going farther with the discussion of farm bookkeeping it is well to determine what the present accounts will give.

WHAT CONSTITUTES FARM PROFIT.

Farmers frequently deceive themselves by not figuring profits correctly. Let us suppose that \$12,000 is invested in a given farm and its equipment and that the current rate of interest on farm loans is 5 per cent. Now, if this \$12,000 were loaned out at this rate it would bring a revenue of \$600 a year. Hence, the first \$600 of net income represents the interest on the investment and not a profit on the operation of the farm. Let us further suppose that the unpaid family labor is worth \$200 and the owner's time and managerial ability is valued at \$400. Then the next \$600 of net income represents wages, not profit. In the case here supposed the net income would have to exceed \$1,200 before there is any real profit.

To determine the actual profit a farm has made during the year, the following accounts are necessary:

- (1) Two inventories, one at the beginning, the other at end of the year.
- (2) The totals of the personal and household expenses during the year.
- (3) The interest paid on indebtedness during the year.
- (4) The value of the supplies furnished by the farm toward the living of the farmer and his family.

Statement showing a method of determining the farm profit.

Item.	April 1, 1911.	April 1, 1912.
Farm inventory:		
Real estate.....	\$13,500.00	\$13,500.00
Live stock.....	2,729.00	2,883.00
Machinery and tools.....	475.00	461.00
Feed and supplies.....	658.00	836.00
Bills receivable.....	46.00	
Cash on hand and in bank.....	670.00	2,148.00
Total farm investment.....	18,078.00	19,828.00
Bills payable.....	2,000.00	1,500.00
Net worth each year.....	16,078.00	18,328.00
Increase in net worth.....		2,250.00
Cash account:		
Personal expenses.....	148.00	
Household expenses.....	420.00	
Interest on mortgage of \$2,000.....	100.00	668.00
Total money paid out for other than farm expenses during year.....		
Supplies and rent:		
Supplies furnished by farm to owner.....	120.00	
Rent of farmhouse (its value to owner).....	180.00	300.00
Total supplies and house rent.....		
Total farm gain.....		3,218.00
Interest and labor:		
Interest on average of total farm investment of \$18,953, at 5 per cent.....	947.65	
Unpaid family labor (estimated).....	300.00	
Owner's labor (estimated).....	480.00	
Total interest on investment, etc.....		1,727.65
Actual farm profit.....		1,490.35

The statement just presented gives the items which are needed and the method used in determining the farm profit. The first part shows the two complete farm inventories. The difference between them, which is \$2,250, represents the increase in net worth exclusive of household and personal goods. This increase includes the farm gain from the growth of live stock, the amount of unsold produce, etc. During the year the farmer paid out of the funds received from the sale of farm products \$148 for personal expenses, \$420 for household expenses, and \$100 interest on the mortgage of \$2,000, making a total of \$668 paid for other than farm expenses. The owner also received from the farm milk, butter, eggs, and garden produce, the total value of which for the year is estimated at \$120. The rental value of the farmhouse to the owner must be counted as a farm receipt and has been estimated at \$180. The house has been included in the farm investment, and, as interest is charged on the total investment, the farm should be credited with the value of this house rent. The \$2,250 increase in net worth plus the \$668 paid out for other than farm expenses plus \$300, the value of the supplies and rent furnished by the farm, constitute \$3,218, the total farm gain.

The farmer had invested \$18,078 the first year and \$19,828 the second year, or an average of \$18,953. This investment should pay

him a fair rate of interest before he can count any profits. Assuming the rate of interest to be 5 per cent per annum, the interest charge is \$947.65; deducting this charge from the farm gain leaves \$2,270.35, which represents the amount that the farmer and his family made during the year. The owner's family, who did some work on the place during the year, were not paid in cash, and the value of their labor should be deducted before showing profits. In this instance it is estimated at \$300; subtracting this estimate from the \$2,270.35 leaves \$1,970.35, which amount can be called the farmer's labor income, or the amount of money that he earned on the farm during the year after all expenses except his own labor were deducted. To find the net farm profit the owner must be paid for his own labor, which in this case is estimated at \$480 for the year. This sum deducted from \$1,970.35 gives a farm profit of \$1,490.35. The last item, and no other, is the actual farm profit.

Many farmers would be better off financially if they sold their farms, loaned their money at 5 per cent, and hired themselves out at current wages. This statement is not made with the idea that every farmer who is not making 5 per cent interest on his money should discontinue farming, but in the hope that it will induce farmers to determine the financial status of their business.

Thus far the account deals only with the inventory and with cash transactions. From these accounts the farm profit or loss and the distribution of the receipts and expenses can be determined. But such records do not tell the best paying crops or the best classes of live stock. The next step is to consider those records of the different farm enterprises that enable the farmer to determine whether potatoes or corn should be grown and whether hogs or cattle should be kept. For this purpose other records are needed in addition to those already described. The most important of these is the labor record.

LABOR RECORDS.

Farm labor records are equally as important as cash records, for in no industry at the present time is labor so inefficiently used as in farming. This statement may seem somewhat unwarranted, inasmuch as the farmer is considered as hard-working and as receiving small pay for his labor. It is true that a great many farmers work long hours and at hard physical labor, but it is not necessarily true that they work efficiently all the time and at work which is returning them a fair wage. Of the 6,400,000 farmers in this country not many of them can tell how many hours of labor it takes to produce a bushel of wheat or a bushel of corn and whether corn or wheat in that particular locality returns them the best wages for each hour worked. Yet when a farmer's work is almost entirely on a few important crops

or classes of live stock should he not know something about the distribution of his labor and what each part is paying him?

Labor records require some time and careful attention, for in no other business does a man work at so many different things as on a farm. He is continually going from one kind of work to another, perhaps spending only a few minutes on each, and especially is this true on the smaller sized farm. Then, again, many operations on the farm can not be directly charged to any particular crop or class of stock, as, for instance, chores or general farm work. If it were all uninterrupted work on some particular crop or definite enterprise the labor records would be a simple matter. The miscellaneous odds and ends of work on the farm cause much loss of time and greatly increase the cost of the really productive enterprises. The labor record is the first step which has to deal with the profit or loss on the separate enterprises within the farm. This labor consists of two kinds, man and horse, each of which must be accounted for. In the following statement are shown the average hours that regular farm laborers on certain farms worked during the different months in the year:

Daily average of hours of labor of regular farm workers, by months, for one year.

1910.	1.—New England dairy farm.		2.—Iowa grain and stock farm.	
	Week days.	Sundays.	Week days.	Sundays.
	Hours.	Hours.	Hours.	Hours.
January.....	11.4	*7.2	10.8	3.9
February.....	11.7	*7.3	11.3	4.9
March.....	11.4	5.1	12.3	4.8
April.....	12.2	5.3	12.2	4.7
May.....	11.9	4.4	12.3	3.6
June.....	11.9	3.7	12.7	3.3
July.....	11.8	3.6	12.6	3.1
August.....	11.3	3.3	12.6	3.2
September.....	11.2	4.0	11.8	2.7
October.....	11.5	3.5	12.3	2.9
November.....	10.3	4.9	12.2	3.3
December.....	9.7	4.3	12.4	*8.2
Yearly average.....	11.35	4.5	12.1	3.9

*During these months only one regular worker was employed, the Sunday work being done by him and the owner. All other months from two to three regular workers were employed.

Figure 1 shows the average monthly cost per hour of man labor on the dairy farm, this rate being determined by dividing the total cost of labor for the particular month by the total hours worked by paid labor during that month. The high cost of labor in September is due to extra labor for silo filling and thrashing. It is commonly supposed that labor costs more in the summer than it does in the winter, but actual records seem to show that on most farms an hour of labor costs more in winter than it does in summer. This fact is

accounted for by the greater length of the working days during the summer.

Figure 2 shows for farm No. 2 the average hours that the farm horses worked on week days during the different months in the year. The average per day for the year was 3.6 hours. There is an enormous waste of labor when the average farm horse in this country is used only $3\frac{1}{2}$ hours a day during the year. It is true that some farmers utilize horse labor more effectively, but our investigations indicate that about $3\frac{1}{2}$ hours a day is the average for the Northern States. These illustrations are given here simply to show the importance of labor records.

There are several methods of keeping labor records, no one of which can be used on all types of farms. Some farmers will find one method easy and satisfactory, while others will find the same method difficult.

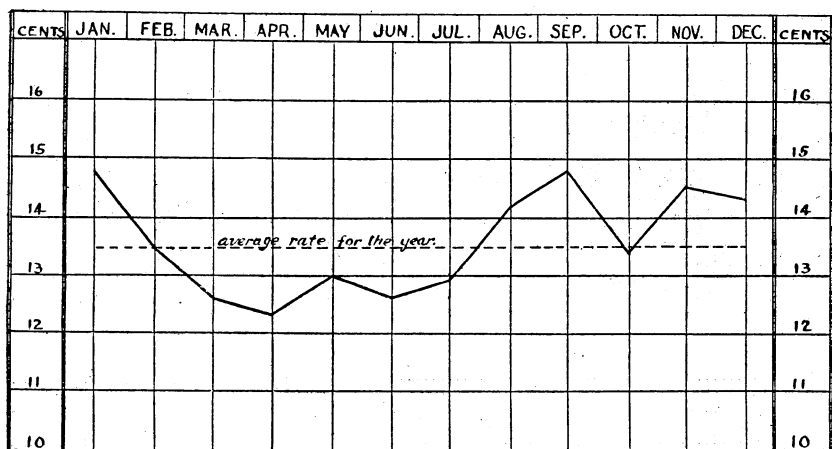


FIG. 1.—Curve showing the actual monthly cost per hour of farm labor on a New England dairy farm in 1910.

For instance, a system of labor records which proves useful on a dairy farm might be totally impracticable on a fruit farm. There are two principal methods of keeping labor records. The first is simply to note the total hours put on each enterprise daily. The second is to itemize all the labor, so that the total hours spent in doing each separate operation on each of the different enterprises can be ascertained. The first method is easier and simpler and for most purposes is quite satisfactory; but for careful study and complete analyses of the costs detailed labor records are needed, and this necessitates using the second method.

Figure 3 illustrates a modification of the Roberts system of labor records. One sheet serves for a month. The different enterprises are written across the top of the page and the dates down the left-

hand margin, each column being divided into two parts for man hours and horse hours, respectively. At the end of the month the total amount of labor spent on each enterprise can be determined and posted to another book. This form of labor record is easy to keep and is useful, as it gives the total hours spent on the different enterprises for the year.

Figure 4 illustrates a form used where the labor records are carried out to the utmost detail. It contemplates that each laborer or some one for him shall make out a daily report similar to the one shown. This method of keeping labor records involves a great deal of work, but for cost-accounting investigations it is practically necessary to use some such system. The form illustrated was designed by Mr. W. A. Peck while connected with the United States Department of

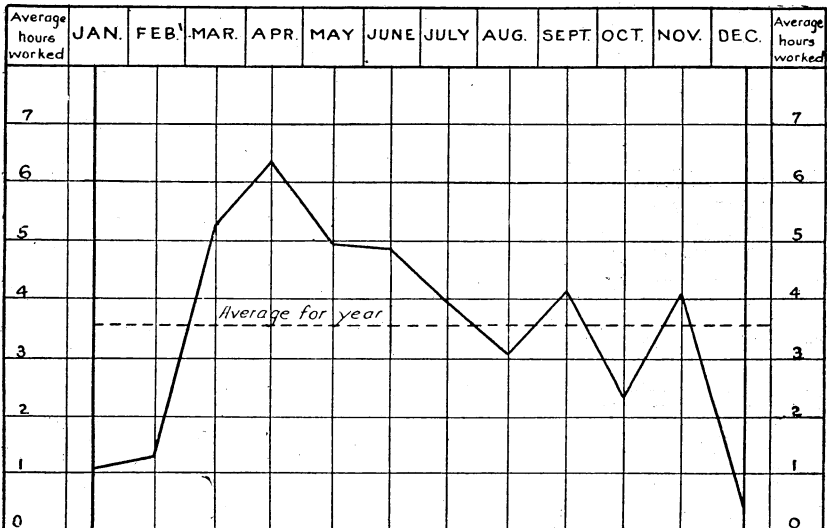


FIG. 2.—Curve showing the average hours of work per day per farm work horse on a 320-acre grain and stock farm in Iowa.

Agriculture. It is designed to meet the needs of the investigator, and goes into greater detail than the average farmer would wish.

Another method has been found useful on some farms. An ordinary ruled book can be used with the headings of different enterprises written in at the top of the pages, similar to the forms illustrated on page 18. Under each heading is noted the amount of labor spent on that particular crop for that day. This method gives at the end of the season a complete record of the labor on each enterprise. From such a labor record the labor costs can be determined.

All labor records should be in terms of hours. Keeping them by days is not satisfactory. The statement of the average hours worked

daily shows that the length of the working day varies greatly. Given the total amount spent for labor, which should include wages, board, room, and other privileges, the actual cost per hour can be easily determined by dividing the total cost of labor by the total number of hours of labor performed.

To determine the cost of horse labor, one must know the approximate cost of keeping the horse during different periods of the year. Cost-accounting records show that the cost of horse labor varies from 6 to 16 cents an hour. The rate depends on the number of horses kept, the cost of keeping them, and the average number of hours' work done per day. On most farms the amount of work done by

MONTHLY WORK REPORT																											
MONTH OF <u>June</u> - 19 <u>11</u>																											
	Corn		Wheat		Oats		Potatoes		Hay								Horses		Cattle		Hogs		Misc		Total		
	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	Man	Horse	
	1	5	10				20	40									1 1/2	5 1/2	1						33	50	
	2	10	20				10	20									2	8	2	2 1/2			2	2	34	44	
	3	9	18				9	19									1 1/2	6 1/2	1			4 1/2	1	32	38		
Sunday	4																3 1/2	5 1/2	1 1/2			4	10 1/2	4			
	5																										
	6																										
	7																										
	8																										
	9																										
	10																										
	11																										
	12																										
	13																										
	14																										
	15																										
	16																										
	17																										
	18																										
	19																										
	20																										
	21																										
	22																										
	23																										
	24																										
	25																										
	26																										
	27																										
	28																										
	29																										
	30																										
	31																										
Total																											

FIG. 3.—Illustration of a form of monthly labor-report blank.

horses is much greater at some seasons than at others. In such cases the cost per hour of horse labor varies greatly from month to month. The best plan is to determine the average for the year and use the result in figuring costs.

RECORDS OF SEPARATE FARM ENTERPRISES.

The preceding pages have been devoted to the consideration of those accounts involving the receipt and expenditure of cash and to the usefulness of and methods of keeping labor records. Labor records are necessary in finding the cost of various farm crops and other farm enterprises, but labor is not the only item that enters into the cost of an enterprise. Hence, if the farmer is to know the actual

profit (or loss) from each crop grown or each lot of stock fed, he must keep other records. If farming were simply growing corn, raising wheat, or keeping a dairy, a separate record of each enterprise would

Form A.

Regular Worker's Daily Time Sheet.

U. S. Department of Agriculture
in cooperation with*Frank Smith*Day of Week: *Monday* Date *July 10 1901*

KIND OF WORK. Include implements used, number of loads, etc.	FIELD.	MAN HOURS.	HORSE.	
			NO.	HOURS.
4.30—				
5.00—				
5.30—		1		
6.00—				
6.30—				
7.00—		1 1/2	1	1 1/2
7.30—				
8.00—				
8.30—				
9.00—				
9.30—		4	1	4
10.00—				
10.30—				
11.00—				
11.30—				
12.00—				
12.30—				
1.00—				
1.30—				
2.00—				
2.30—		4 1/2	2	9
3.00—				
3.30—				
4.00—				
4.30—				
5.00—				
5.30—		1 1/2		
6.00—				
6.30—		1 1/2		
7.00—				
7.30—				
8.00—				
WORKMAN <i>O. Neal</i>	TOTAL HOURS	12		14 1/2
REMARKS <i>Need rain. Corn suffering</i>			REPORT O. K.	
<i>Hay short</i>			<i>[Signature]</i>	

FIG. 4.—Illustration of a desirable form for detailed farm-labor records.

not be needed in order to learn the source of profit or the cause of loss; but farming is generally more or less diversified, the income being received from several sources. These sources may be hogs,

cattle, poultry, fruit, wheat, hay, potatoes, truck crops, and the like. It is necessary to know what each of these enterprises returns for the expenditures made upon it, if the farm is to be conducted in a businesslike manner. The cost, income, and profit of a field of corn is given in Table I.

TABLE I.—*Account with a crop of corn in field B (36.48 acres) on an Iowa farm, 1910.*¹

Items of statement.	Date.	Total—			Per acre—			Per bushel.
		Man hours. ²	Horse hours. ²	Cost.	Man hours. ²	Horse hours. ²	Cost.	
Plowing, fall of 1909 (14-inch gang).	Mar. 25 to Apr. 2....	85½	342	\$46.48	2.34	9.38	\$1.279	.....
Disking.....	Apr. 7 to 29.....	90½	361	49.28	2.47	9.89	1.351	.....
Harrowing.....	Apr. 23 to May 4....	25½	51	8.56	.70	1.40	.235	.....
Planting (with planter)	Apr. 30 to May 5....	30½	61	10.25	.84	1.67	.281	.....
Harrowing (after planting).	May 10 to 14.....	33½	72½	11.86	.92	1.99	.325	.....
Cultivating (first time).	May 27 to 30.....	58	116	19.49	1.59	3.18	.534	.....
Cultivating (second time).	June 3 to 6.....	54½	109	18.31	1.49	2.99	.502	.....
Cultivating (third time).	June 14 to 18.....	51½	103	17.31	1.41	2.82	.474	.....
Cultivating (fourth time).	June 23 to July 5....	57	114	19.15	1.56	3.12	.525	.....
Picking seed corn.....	Sept. 27 to Oct. 7....	59	.....	7.44	1.62	.....	.204	.....
Husking (from standing stalks).	Nov. 2 to 22.....	305½	611	102.65	8.38	16.75	2.814	.....
Total labor cost.....		851	1,940½	310.98	23.32	53.19	8.524	.....
Manure charge.....				124.91			3.424	.....
Seed, 5½ bushels, at \$5.				27.50			.754	.....
General expense.....				18.24			.500	.....
Equipment.....				23.27			.638	.....
Taxes.....				25.53			.700	.....
Interest (rent).....				255.35			7.000	.....
Total cost.....				785.78			21.54	.....
Summary:								
Income ³				1,127.36			30.90	\$0.512
Cost.....				785.78			21.54	.357
Profit.....				341.58			9.36	.155

¹ Previous crop: Timothy for seed, 1909.

² Rates per hour: Man hours, 12.6 cents; horse hours, 10.5 cents.

³ Yield: 2,200 bushels of grain, at 50 cents (average, 60.3 bushels per acre), \$1,100; stalks, \$27.36; total, \$1,127.36.

The figures in this table are taken from records of actual experience. The number of hours of man and horse labor is given for each operation, such as plowing, disking, etc. The cost of man labor was determined as stated on page 23. The value of the owner's labor and of family labor was counted at the same rate as for the regular workmen, although it was not paid for in money. The cost of the horse labor was determined by taking the total hours that the farm horses worked during the year and dividing it into the total cost of keeping these horses for the year. The rates for man and horse labor are the actual rates found on that particular farm for that year. When records sufficient to determine the actual cost of horse labor are not

at hand, the next best plan is to assume a cost based upon such data as can be had.

In addition to the labor cost the table shows certain other charges against the crop, namely, the cost of seed, the value of manure used (only part of which is charged to the corn crop, the remainder being charged to later crops), the use of implements and machinery, general expenses, taxes, and land rental or interest on the investment in land. The total of all these charges gives the total cost of growing the corn up to the time it is put in the crib. The equipment cost, or the charge for the use of machinery, is difficult to determine accurately. In this illustration the equipment charge was arrived at through carefully kept records relating to the investment in, repairs of, and depreciation of the implements used in growing the crop. It is not expected that many farmers will work out these equipment charges in such detail, as it is not necessary in determining the approximate cost. A good plan for the farmer to follow in this matter is to use average figures for the acre cost of each of the machines or implements used, such as are given in Bulletin 73 of the Bureau of Statistics, entitled "The Cost of Producing Minnesota Farm Products, 1902-1907," and Bulletin 212 of the Bureau of Plant Industry, entitled "A Study of Farm Equipment in Ohio."¹

Another way of arriving at the machinery cost per acre is to estimate the annual cost (depreciation, repairs, and interest) of each implement and to divide this estimate by the number of acres on which the machine is used during the year. Thus, if a plow cost \$12 and the depreciation is 10 per cent (\$1.20) a year, the repairs \$1 (including sharpening), and the interest (at 5 per cent on the average value of \$6 for its estimated life period of 10 years) 30 cents, the total cost of the plow per year is \$2.50.

Now, if this plow is used on 50 acres during the year, the acre cost is 5 cents. But if the plow is used on only 10 acres, then the acre cost becomes 25 cents. This estimate does not allow for the slight increase in the items of repair and depreciation where the machine is used on the larger acreage, but these charges do not increase in direct proportion to the acreage covered.

The rental value of the land is also a difficult charge to determine, inasmuch as it depends on the value of the land and on current rates of interest. Some parts of the farm are more fertile than others and hence are worth more. The most accurate method of determining the charge for land rental is to place a definite valuation on the land in each field of the farm and then fix the rental value at a sum equal to the interest on that value. The rental or interest

¹ Application for either of these bulletins should be addressed to a Senator, a Member of Congress, or to the Secretary of Agriculture, Washington, D. C.

charge forms a large percentage of the total cost of most crops. In the crop of corn shown in Table I it is one-third of the total cost.

The relative profitableness of the different farm crops is an excellent guide to the farmer in planning his cropping system. Yet it must be kept in mind that cost is only one of the things to be considered. The distribution of labor throughout the season is highly important. As far as possible crops should be grown that do not require large amounts of labor at the same time.

LIVE-STOCK RECORDS.

In addition to the cost and income from crops, it is equally important on farms where live stock are kept for profit to secure similar records for each class of such stock. It not infrequently occurs that a farmer turns a profitable crop into a loss through injudicious feeding. In the following paragraphs the records needed to determine the gain or loss on a single class of live stock are shown and methods are suggested for keeping them.

Table II shows the items that are included in such an account. Some of these items are easily determined; others are estimates, and the accuracy of the final result depends largely on the accuracy with which these estimates are made. It is seen that the estimated value of the manure is about one-third of the final profit. The data as given in the table are an approximate yearly record on a Wisconsin dairy farm.

TABLE II.—Outline account for one class of live stock: Dairy herd.

Data.	Item	Subtotal.	Total.
Inventory:			
Jan. 1, 1910—			
Live stock—47 cows, 3 bulls.....		\$2,725.00	
Equipment.....		409.30	
Total.....			\$3,134.30
Jan. 1, 1911—			
Live stock—38 cows, 2 bulls.....		2,395.00	
Equipment.....		373.60	
Total.....			2,768.60
Difference (decrease).....			365.70
Receipts:			
Milk and cream (225,689.3 pounds).....	\$3,630.29		
Cows sold.....	1,521.60		
Bulls sold.....	117.60		
Calves sold (34).....	227.60		
Total receipts.....			5,497.09
Expenses:			
Mixed hay, 26.5 tons.....	212.00		
Alfalfa hay, 10.71 tons.....	128.57		
Silage, 168.28 tons.....	673.15		
Grain, 34.38 tons.....	835.12		
Pasture, 7 months.....	275.86		
Total feed cost.....		2,124.70	

TABLE II.—Outline account for one class of live stock: Dairy herd—Continued.

Data.	Item.	Subtotal.	Total.
Expenses—Continued.			
Man labor, 8,819½ hours, at 12 cents	\$1,058.34		
Horse labor, 1,443½ hours, at 10 cents.....	144.35		
Total labor cost.....		\$1,202.69	
Feed for bulls.....	80.33		
New equipment.....	5.23		
Repairs on equipment.....	1.31		
Salt.....	13.70		
Advertisements.....	22.50		
Miscellaneous (general expenses, etc.).....	49.05		
Decrease in inventory.....	365.70		
Total miscellaneous expenses.....		537.82	
Total expenses.....			\$3,865.21
Difference between receipts and expenses.....			1,631.88
Interest at 5 per cent on average investment in cattle and equipment.....		147.56	
Building charge, \$6 per cow per year.....		255.00	
			402.56
Balance.....			1,229.32
Add estimated value of manure.....			641.05
Profit.....			1,870.37

It will be noted in Table II that the first items given constitute an inventory of the class of live stock considered. This inventory is made in order to determine the increase or decrease of the value of the herd during the year. In a set of farm accounts the inventory of the different classes of live stock would be included in the regular farm inventory. The receipts which can be credited to the dairy herd are milk, cream, and live stock sold. In addition to these sources of income, the herd should be credited with the value of the manure produced. This item is added later as a special credit and is not included with the actual income. The amount of credit to allow the herd for manure is one of the most difficult points in all farm bookkeeping. Generally speaking, manure has no market value in farming communities, and its actual worth to the farm will vary greatly. Each farmer must be his own judge as to the value of manure. Where the manure is wisely used, its value will usually not vary widely from \$1 per ton on dairy farms, and the amount produced per head will not vary greatly from a ton per month. The proportion of the manure that becomes available depends on the length of time the cows are stabled and on the care given the manure.

Under expenses are feeds, including that for the herd bulls (see Table II), man and horse labor, equipment, repairs, and miscellaneous expenses. In addition to these direct charges, certain other items must be taken into consideration in order to determine the profit or loss for the year. We have already credited the herd for sales of live stock, the amount received from this source being over \$1,800. Now,

if the herd were worth as much at the end of the year as at the beginning this \$1,800 would all be clear profit, but the inventory shows that the value of the herd because of these sales has decreased by \$366.30. The profit from sales of stock is thus \$366.30 less than \$1,800. For this reason we include the decrease in inventory in the charges against the herd, so that it will finally be deducted from the \$1,800 which has been included in the income.

Finally, we must take account of the interest on the money invested and the interest and the depreciation on the barn. Interest on the investment is not an actual expense, and hence is given in a separate list beneath the list of actual expenses. With it is given the item of barn rent. This latter item represents an actual expense, but it may be an expense incurred several years earlier; it may be a part of the actual current expenses also, as is the case when the barn has not been paid for and the farmer is paying interest on the money used in building the barn.

Dairy farmers not infrequently delude themselves into thinking they have determined the profit on their herds when they have deducted the cost of the feed from the income received from sales of dairy products. Table II shows how far they are in error when profits are estimated in this manner.

The method of keeping feeding records of a class of live stock will be taken up more in detail in another paragraph.

The labor records of live stock are not hard to determine, for the amount of labor required each day is fairly uniform. A careful estimate can be made of this labor once or twice a month and the total for the year then ascertained. The total based on these monthly estimates will not be absolutely accurate, but will be near enough for all practical purposes. The depreciation charges for the live stock, which are often included in live-stock accounts, are taken care of by the increase or decrease in the inventory. The interest on the investment can be based directly on the average investment as shown by the two inventories. The building charge, or the cost of housing the live stock, should be based on the investment in buildings and the annual repair, depreciation, and interest charge. This figure is difficult to determine accurately, but most farmers will be able to determine it with sufficient accuracy for their purposes.

In charging the different classes of live stock for feed several different practices are followed, and the results obtained are largely governed by the method used. Often it happens that a farmer is more interested in his cattle than in his crops. In order to make his dairy show a profit he will charge the herd with the estimated cost of the different crops which he grows for feed. This cost price may be very much lower than the prevailing market prices of the grain

and hay or other roughage. If there is any profit from the operation of the farm, this method gives all the credit for this profit to the cows. Other farmers charge the live stock full market price for feed raised on the farm. This is undoubtedly the correct procedure, but the price used should be the price *at the farm* and not the price at the near-by market point. The price at the farm and at the market point differ by an amount equal to the cost of hauling the feed to or from market. But when cows are charged market prices for feed, they must also be given credit for the manure they produce.

After a farmer has kept records for several years relating to the cost of different enterprises and to the cost of caring for and feeding live stock, he will be able to work out certain standards which he can thereafter use from year to year. For instance, if a dairyman has kept records for four or five years on the amount of labor required in caring for dairy cows and finds this to be about 16 hours per head per month, he may thereafter use this figure in his records rather than go to the trouble of keeping careful records covering this point each year. If more of these normal farm costs were known many of the worst difficulties in farm bookkeeping would disappear. It is because practically no information is available on many of these points that there is the utmost need for careful work. Under present conditions it is only by having fairly accurate records for a series of years that the farmer can determine with reasonable certainty the cost of any live-stock product. This matter is one of great importance. For example, if dairymen in the Eastern States could state definitely that a quart of milk costs 4 or 5 cents, or whatever the figure may be, they would then be in position to demand a price which would give them a margin over the cost of production. Until such costs are determined it is doubtful whether the consuming public will recognize the difficulties that confront the dairy farmer.

LIVE-STOCK PRODUCTION RECORDS.

In addition to the records of herds or groups of live stock, records are sometimes necessary for each individual animal. This is especially true of dairy herds where the same animals are kept for several years. The milk record of the individual cows is one which is exceedingly important on all dairy farms. It is not necessary, for ordinary purposes, to keep a daily record of the weight of the milk produced by different individuals of the herd; a record of the production of each animal for a certain day each month will usually serve quite as well. Using this as a basis the total production during the year for each cow can be estimated very closely. The total milk yield of a cow, estimated on the basis of one weighing each month, will seldom be more than 3 per cent in error from the true production. If

milk is marketed on the basis of its butter-fat content, then the butter-fat records are equally as important as the milk records. Several forms for keeping milk records are used by the different State colleges and experiment stations, each with its individual merits, and any of them will be found satisfactory. An essential point in keeping any live-stock production record is to have the blanks handy and in such form that they can be totaled without trouble at the end of the month.

FEEDING RECORDS.

It is believed that the most difficult records with which the farmer has to deal are feeding records. These are of such a nature that in keeping them one is constantly dealing with uncertain quantities and values. It is a problem to know the value of a certain crop when it is placed in the barn for feeding purposes, as the quality of that crop may be above or below the average. Again, the amounts fed to each animal, or even to the different classes of live stock, are more or less of an estimate; it is nearly impossible under commercial conditions to weigh the feed at each feeding, as any one knows who has ever taken care of a large number of cattle or stock of any kind. But this fact should not discourage the farmer from attempting to keep a feeding record, for such a record can be made exceedingly useful and valuable. A careful estimate based on the weighing of feeds one day in a month is usually sufficient to give a very satisfactory idea of the total amount of feed consumed by each animal or herd, as the case may be. Where high-priced grain is fed it often happens that a ton of grain is worth more than a ton of milk, and one can not afford to be ignorant of the actual amount fed. Fortunately, it is comparatively easy to weigh or measure grains and other concentrated feeds. The weighing of feeds also eliminates irregular feeding, whether the feeding is done by the same man or by different men, and this tends to prevent fluctuation in milk yields; oftentimes also it prevents sickness of animals. Numerous kinds of feeding-record blanks are in use by farmers and by different agricultural colleges, but none of them are suited to all conditions. If feeding records are to be kept it is a simple matter to draw up a form which will answer the purposes of the feeder. The main point is to have some clear, concise form on which the records can be uniformly kept and in such manner that they can be tabulated with the least possible effort. It is useless to go to the trouble and expense of keeping records unless they are made of some use.

It is surprising how little attention has been given to the cost of keeping work horses, for this is one of the largest items of expense on a great many farms. For the most part the feed given to horses is of higher quality than that given other stock and is more expensive. In Extension Bulletin 15 of the University of Minnesota are given the

results of some accurate horse-feeding records on farms in that State. The investigations show that the annual cost of keeping a horse several years ago, when prices were lower than at present, was about \$85. This cost is certainly high enough to warrant careful consideration by the farmer; too many horses will eat up the profit in farming. When it is considered that the average farm horse works only about $3\frac{1}{2}$ hours for each week day in the year it is evident that more attention should be given to the efficient use of horse labor.

INTERPRETATION AND USE OF FARM ACCOUNTS.

In the foregoing pages are outlined very briefly the reasons for farm bookkeeping, and methods and forms are suggested for carrying it out on ordinary farms. The question arises, How can the information gained by these records be applied to the various phases of the farm business? Time and energy spent in keeping accounts are absolutely wasted unless an intelligent use is made of them. Moreover, one must not suppose that a number of records are needed before anything valuable can be obtained from them. It is surprising what useful information can be secured from a few simple records. It is even more surprising what wrong interpretations can be drawn from a set of farm accounts by one who does not understand their real meaning.

The subject of cost accounting on the farm is one of exceptional perplexity. The difficulty is mainly due to the fact that so many of the factors entering into the final result can not be determined with absolute precision and hence must be more or less in the nature of estimates. For example, the manure produced by a herd of cows or by a herd of fattening stock may be the major consideration in keeping stock at all and may justify feeding animals at an actual loss so far as the cost of feed and the value of production are concerned, yet it is not possible to determine with any great degree of accuracy the value of this manure. Again, the cost of an enterprise may depend on such factors as the length of time an implement will last, the amount of its use, the proportion of manure or fertilizer which applied to a given crop will be used by that crop and how much will be available for later crops—all more or less indeterminate.

Another difficulty arises from the dependence of cost in one case on costs in others. Thus, the cost of producing a crop of corn depends in part on the annual cost of keeping a horse, and this cost in turn depends in part on the rate of depreciation of farm buildings. Hence, the annual cost of the barn in which the horse is stabled becomes a factor. The cost of a crop of corn also depends on the acre cost of farm machinery, a very difficult matter to determine with accuracy.

No attempt has been made in the foregoing pages to treat the subject of cost accounting in an exhaustive manner. It has been the aim rather to deal with as simple a record as possible and yet at the same time have the results of sufficient value to be of use to the farmer. The trained agricultural student or the business-college graduate will no doubt desire a more detailed system than has been outlined here, and in this desire he is perfectly justified. But the average farmer is not a trained bookkeeper, and the very nature of his work is such that it is hard for him to do clerical work. After being in the field all day or out in a cold biting wind, it requires considerable exertion to write up a set of accounts in the evening. The farmer is trained to do physical work and, although he is intelligent and capable when it comes to deciding important matters, it is difficult for him to do clerical work of this character. When physically tired it is doubly difficult to do such work as adding a column of figures. Farm bookkeeping is a matter of adapting simple methods to the farmer's needs. It is not a question of forms or having the accounts on the right side of the page or of having them balanced in a certain way, but it is a question of a correct knowledge and understanding of the facts as they exist on that particular farm.

In the preceding pages no effort has been made to outline a full double-entry system of bookkeeping, although it is admitted that such a system would give more complete and systematic results than the simpler methods presented here. Those who have the necessary knowledge of bookkeeping to manage these more complicated systems may very well do so if they desire, but for the average farmer this would hardly be practicable and the simpler methods outlined here are believed to be more satisfactory.

SUMMARY.

Good accounts are as useful to the farmer as to the business man, since farming is a business the same as banking or any other commercial enterprise. Farm bookkeeping does not require that the account be kept in a particular form or upon a certain side of the page, but is a logical selection and arrangement of farm data to permit correct interpretation.

The difficulties of farm bookkeeping are generally overestimated, an entirely wrong impression being held by many people on this subject. Complex forms and methods do not always mean successful farm accounting, for sometimes a few pages of well-selected records are of more practical value than volumes of figures.

Inasmuch as the farm business and the home are practically inseparable, personal and household accounts are needed to balance

the books. Both of these accounts are best handled by grouping the items as much as possible.

A complete inventory is the first and most important step in starting the accounts. The determination of proper values is a matter of good judgment, aided by a study of current market prices.

The cash transactions on a farm may be kept in several ways, but entering the items directly in their respective accounts appears to be one of the most satisfactory methods.

A thorough understanding of what constitute farm receipts and expenses is necessary; otherwise the profit of the farm is seldom figured correctly.

A farm is a combination of enterprises, and a study of each enterprise in its relation to the others is of the utmost importance. Wheat may be a profitable crop to grow, oats an unprofitable crop. Records of the separate farm enterprises will show the facts in each case.

Labor distribution records are seldom kept by farmers, yet such records are in many respects equally as important as the cash account. A good bank balance is often the result of the efficient use of farm labor.

Crops which are grown at a profit may, by being fed to a poor class of live stock, have this profit turned into a loss. Live-stock records, although not so easy to keep as those on crops, are often more useful to the farmer. It is poor policy to lose by injudicious feeding the profits on the crops grown.

Live-stock production records are a guide to the qualities of animals kept; such records are of the utmost importance to the dairyman.

Good accounts are within the reach of every farmer. The few minutes regularly spent on them will yield larger returns than an equal amount of time devoted to farm work, provided proper use is made of the information the records contain.

[A list giving the titles of all Farmers' Bulletins available for distribution will be sent free upon application to a Member of Congress or the Secretary of Agriculture.]